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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Vadim Y. Banine

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EXAMINER

NGUYEN, LAM S

ART UNIT

PAPER NUMBER

2853

MAIL DATE

DELIVERY MODE

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 09/943,758	Applicant(s) BANINE ET AL.	
	Examiner LAM S. NGUYEN	Art Unit 2853	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 November 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13, 15, 16 and 18-26 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-13, 18, 19, 23 and 24 is/are allowed.
- 6) ☒ Claim(s) 15, 16, 20, 21, 25 and 26 is/are rejected.
- 7) ☒ Claim(s) 22 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 15-16, 20, 21, and 25-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tanaka et al. (EP 1020897 A1) in view of Klebanoff et al. (US 6533952).

Referring to claims 15, 20:

Tanaka et al. discloses a lithographic projection apparatus comprising:

projecting a patterned beam of radiation onto a target portion of a layer of radiation-sensitive material on a substrate held by a table (*FIG. 4, elements W and WS*); and

supplying a gaseous (*FIG. 4, element 150*) to a space in a radiation system of the lithographic projection apparatus, which space contains a mirror (*FIG. 4, elements 201, 203, 208*).

Tanaka et al. however does not disclose wherein the supplied gaseous is hydrocarbon/alcohol/ethanol forming a cap layer on said mirror, wherein the projecting causes sputtering of the cap layer, and wherein the gaseous alcohol is supplied to said space at a pressure sufficient to achieve a thickness of said cap layer which does not increase substantially over time.

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Klebanoff et al. suggests that in order to protect a surface of a component such as mirror (*column 3, lines 50-54 and column 4, lines 10-20*) exposed to or sputtered by a radiation source, a gas, typically a hydrocarbon such as alcohol, is introduced into the environment of the surface (*Abstract; column 3, lines 62-66; and column 4, lines 60-65*) to bond/form a cap layer on the mirror, wherein the radiation causes sputtering of the cap layer, and wherein the gaseous alcohol is supplied to said space at a pressure sufficient to achieve a thickness of said cap layer which does not increase substantially over time (*column 3, lines 61 to column 4, line 5: "Prior to exposing surface 210 to incident radiation, a small amount of a hydrocarbon gas that will also bind to surface 210 is admitted to the system" means that the binding of the hydrocarbon gas to surface 210 forms a cap layer of hydrocarbon on the surface 210 before the cap layer is sputtered by the incident radiation. Moreover, because the sputtering will cause the hydrocarbon molecules bound to the surface 210 be dissociated, the thickness of the cap layer of hydrocarbon would not increase substantially over time. In addition, since the pressure gas is maintained at a certain value, the thickness of the hydrocarbon layer would not increase substantially over time due to the increase of the pressure gas*), wherein, in use, the layer of hydrocarbon is formed on the mirror by adsorption of the gaseous hydrocarbon (*column 2, lines 14-16: "Surface 110 has both hydrocarbon and water molecules adsorbed thereon"*).

Therefore, it would have been obvious for one having ordinary skill in the art at the time invention was made to modify the gas supply source disclosed by Tanaka et al. to supply hydrocarbon gas as disclosed by Klebanoff et al. The motivation for doing so would have been to eliminate reactive oxygen species that could oxidize the surface and degrade its reflectivity as taught by Klebanoff et al. (*column 3, line 65 to column 4, line 8*).

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Allowable Subject Matter

Claims 1-13, 18-19, 23-24 are allowed. Claim 22 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The reasons for allowance are in light of the Applicant's arguments dated 11/06/2008.

Response to Arguments

Applicant's arguments filed 11/06/2008 regarding to claims 15 and 20 have been fully considered but they are not persuasive. The Applicant's argument about controlling the gas supply in responsive to a signal from at least one sensor is out of the scope of claims 15 and 20, because the claim language does not include such feature. In addition, the Examiner disagrees with the Applicant's assertion that the combination of the prior art would render the modified system unsatisfactory, because the effect of hydrocarbon gas in the system depends on the amount of hydrocarbon gas admitted into the system. With a "small amount" of hydrocarbon gas that may be enough to protect the surface of the mirror, but may not be enough to sufficiently affect the system. Moreover, the claimed "sputtering" is broadly interpreted as colliding/bombing a surface of a material with high energy particles; Such process is just like radiating a particle beam on a surface of a material to cause colliding the particles in the beam to the surface of the material or any layer formed on the surface. Finally, the dissociation of the hydrocarbon molecules bound to the surface 210 due to the radiation certainly keeps the thickness of the bonding layer from increasing.

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Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LAM S. NGUYEN whose telephone number is (571)272-2151. The examiner can normally be reached on 7:00AM - 3:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, STEPHEN D. MEIER can be reached on (571)272-2149. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/LAM S NGUYEN/
Primary Examiner, Art Unit 2853